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Abstract

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Keywords

Asian, Regionalism, Evidence, Impact, ASEAN, Free, Trade, Agreement, its, Member, Countries

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NEW ASIAN REGIONALISM: EVIDENCE ON THE IMPACT OF THE ASEAN +3 FREE TRADE AGREEMENT ON ITS MEMBER COUNTRIES

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ABSTRACT

The emergence of new Asian regionalisms such as ASEAN+3 (10 ASEAN countries plus China, Korea and Japan) and other bilateral, plurilateral and multilateral free trade agreements in recent years requires research into these important developments and their underlying fundamental trade-growth causation. Popular existing methodologies such as the CGE/GTAP, gravity theory and panel regression (Dollar and Kraay, 2004) may be inappropriate due to their limited scope, heavily calibrated structure, cross-section data or non-simultaneity features (see also other criticisms in Productivity Commission Report, 2003). The paper extends the gravity theory to time-series data and applies a new flexible modelling approach to construct a simultaneous-equation model of trade and growth for the ASEAN and the East Asia 3. Using data from the World Bank national accounts and CHELEM regional and international trade over the period 1968-2000, the paper then estimates the model by both standard (OLS and 2SLS) and improved Stein-like (2SHI) estimation methods to provide superior MSE impact estimates. Implications of the findings for ASEAN+3's economic integration, trade policy and prospects for trade and welfare improvement for this important regional FTA will also be discussed.

JEL classification: *C32, C51, C52, F02, F14, F15, F42, O11, O41, O53*

Key words: *New Asian Regionalism, Free Trade Agreement, Economic Integration, ASEAN, ASEAN+3, Trade and Growth, Gravity Theory, Causality, Economic Modelling, Estimation Methods, Economic and Trade Policy.*

1. INTRODUCTION

The recent emergence of new Asian regionalism ASEAN+3 (i.e., 10 ASEAN countries plus China, Korea and Japan) and other bilateral, multilateral and plurilateral free trade agreements (FTAs) such as Australia-Thailand, Australia-US, Japan-Singapore, Korea-Chile and ASEAN+5 (ASEAN+3 plus Australia and New Zealand) compels new research into the fundamental issues of trade, integration and growth, and the viability, sustainability or expansion of these important developments. While an apparent reason for this emergence may be its country members' proximity (distance, size and area) in the Asian region, other economic and non-economic factors may also play an important and interdependent part. To date however, only limited work has been done and reported on the causal and quantitative significance of these factors (see ASEAN, 2002). In addition, existing methods for this kind of study such as the CGE/GTAP, gravity theory and panel regression have, by their construct,

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limitations in dynamic structure, scope, temporal (time-series) and simultaneity features such as recent Asia crisis and global slowdown. The paper proposes some improvement in this context first to extend the standard gravity theory (see for example Linneman, 1966, Harrison, 1996, Frankel and Romer, 1999) to construct appropriate simultaneous-equation trade-growth models in flexible functional form (Tran Van Hoa, 1992a). It then uses 2002 World Bank World Tables' national accounts and France's CHELEM trade time-series data and recent improved 2SHI estimation methodologies (Tran Van Hoa, 1985, 1986b, 1986c, 1997, and Tran Van Hoa and Chaturvedi, 1997) to fit these models to provide empirical evidence on ASEAN+3 trade-growth causality and historical support (or a lack of it) for this FTA. Trade and growth policy implications and sustainable prospects for ASEAN+3 countries are also briefly discussed, and possible applications to other free trade agreements (e.g., ASEAN-India) and economic integration suggested.

2. NEXUS BETWEEN ASEAN+3 AND GRAVITY THEORY

Since the principal objectives of FTAs are trade liberalisation and welfare improvement (as well as economic integration) for member countries, the FTA premises are that trade (international and domestic) directly and other determinants of trade indirectly significantly and causally affect economic welfare (see Raimondos-Moller and Woodland, 2002) and growth (for developed countries – see Frankel and Rose, 1998, Frankel and Romer, 1999) and development [for developing countries, see Harrison (for all countries), 1996, Frankel *et. al.*, (for 10 East and South East Asian countries), 1996, and Tran Van Hoa (for ASEAN, China, Korea and Japan), 2002a]. The outcomes also are mutually beneficial in many other non-economic aspects (e.g., closer international co-operation and collaboration, social harmony, political stability and prosperity), and, in the context of globalisation, conducive to regional or international economic integrations (ASEAN, 1999).

In view of the expected final outcomes of higher growth or development improvement for trading partners or FTA member countries, a useful causality concept in the form of a gravity theory using geographical, demographic and other common or concurrent attributes (see for example Linneman, 1966 and the specification in Table 3 in Frankel *et. al.*, 1996) to explain trade flows between countries has been proposed and widely applied in empirical studies of this kind (see also Rose, 2000). Some extensions to this theory's determinants using OECD country data have also been attempted to deal with trade correlations and output fluctuations (see for example, Otto *et. al.*, 2002). In the case of Asian economies or especially the ASEAN+3 member countries in a bilateral context which are our focus for study, only limited research on the validity of the required premises underlying the foundation of this FTA (namely, given their regional proximity but diverse culture, history and development components, does trade cause growth in the member countries?) both of a qualitative or quantitative kind has been done or reported. The study below is a response to this.

3. A TRADE-GROWTH MODEL FOR ASEAN+3

Consider, for convenience and without loss of generality, a simple model of two simultaneous implicit functions (extension to more functions is straightforward more variables are considered and endogenised) comprising and extending the basics of gravity theory linking trade and growth between 2 trading countries. In this model, trade (named T) may be defined as exports or imports or openness

(exports plus imports) (Frankel and Romer, 1999, Dollar and Kraay, 2004), and growth (Y) may be defined as GNP or, by convention, GDP. The 2 countries may be comprehensively all possible pairs of the 13 ASEAN+3 members or, more specifically and within our focus, as pair-wise (bilateral) combinations of the ASEAN as a group and one of these East Asian member countries separately. Thus,

$$F1(a,Y,T) = 0 \quad \text{... (1)}$$

$$F2(b,T,Y,X,W) = 0 \quad \text{... (2)}$$

where F1 and F2 are two arbitrary functionals, a and b are parameter vectors, X and W denote, respectively, other economic (fiscal, monetary, trade and industry policy – see Sala-i-Martin, 1991, and Dollar and Kraay, 2004) and non-economic (e.g., distance, area, size, policy shifts and external shocks – see Johansen, 1982) variables, relevant to a country or a group of countries' growth or development. Importantly, in addition to T and Y, data for X and W must be available and consistent with published time-series data in a standard Kuznets-type accounting framework (e.g., SNA93) or the recent World Bank World Tables.

Taking the total differentials of (1) and (2) and neglecting terms of second and higher –order (see for example Allen 1960 and Tran Van Hoa, 1992a), the 2-equation model (1)-(2) can be written in stochastic forms and in terms of the rates of change (Y%, T%, X% and W%) of all the included exogenous and endogenous variables (Y, T, X and W) as:

$$Y\% = a1 + a2T\% + u1 \quad \text{... (3)}$$

$$T\% = b1 + b2Y\% + b3X\% + b4W\% + u2 \quad \text{... (4)}$$

In their non-stochastic forms, these equations form the basis of applied or computable general equilibrium (CGE) models of the Johansen class in which all elasticities are usually assumed to be given or known a priori, and the impact of endogenous or endogenised variables (say T) on Y is dependent on the exogenous variables and calculated system-wise using such iterative procedures as the Gauss-Euler algorithm. For estimation, the Y% equation (which has a functional specification similar to that proposed by Caselli et al. 1996, and adopted by Dollar and Kraay, 2004) can also be written in its structural (5) and reduced form (6) as:

$$Y\% = a1 + a2\,T\% + v1 \quad \text{... (5)}$$

$$Y\% = p1 + p2X\% + p3W\% + v2 \quad \text{... (6)}$$

where v's are the new disturbances with standard statistical properties. Equation (5) and the reduced form for its endogenous T can be written in full for our study below as:

$$Y\% = a1 + a2\,T\% + a3ST + v1 \quad \text{... (7)}$$

$$T\% = p1 + p2\,YT\% + p3\,FT\% + p4\,MT + p5\,PT + p6ERT + p7IT + p8POT + p9ST + v2 \quad \text{... (8)}$$

where, ASEAN trade (T%) with its trading partner is assumed to cause, together with ST, ASEAN growth (Y%) but this trade is also affected by economic activities, trade-related policies and external or internal shocks in the ASEAN and its trading partner (either China, Korea or Japan or all 3 East

Asian economies combined). Assuming for convenience that ASEAN's trade [traditionally defined as its exports (or imports, see Barro and Helpman, 1991)] with its trading partner is affected by this partner's GDP and other major economic activities, trade-related policies (see Coe and Helpman, 1993 for this approach) or external or internal shocks in its trading partner, then Equation (8) in its reduced form simply assumes that ASEAN partner's trade is simply affected by the exogenous factors such as GDP (named YT), inflation (PT) – see Romer (1993), Dollar and Kraay (2004), fiscal policy (FT), monetary policy (MT), trade policy and exchange rates (ERT) – see Rose (2000), industry structure (IT) – see Otto *et. al.* (2002), population (POT) – see Frankel and Romer (1999), and internal or external shocks (ST) – see Johansen (1982) - of its trading partner.

4. ALTERNATIVE ESTIMATION AND IMPACT STUDY METHODS

Parameter estimates from (7) and (8) play an important part in trade-growth studies (see Frankel and Romer, 1999, and Dollar and Kraay, 2004). A new method to obtain estimates and forecasts of parameters in (7) and (8) with better properties than the OLS in Wald risks has been proposed (see Tran Van Hoa, 1985, Tran Van Hoa and Chaturvedi, 1988, 1990, 1997). Denote b, bs, bh, b+s and b+h for OLS, Stein, 2SHI, positive Stein and positive 2SHI respectively. Then this new method provides a class of explicit improved Stein-rule or empirical Bayes (also known as the two-stage hierarchical information or 2SHI estimators for linear regression models). This estimator includes the explicit Stein and the double k-class (Ullah and Ullah, 1978) estimators as subsets (Tran Van Hoa, 1993a). Other applications of the Stein, Stein-rule, and 2SHI estimators to linear regression models with non-spherical disturbances and to Zellner's seemingly unrelated regression model have also been made (see Tran Van Hoa *et al.*, 1993, in the case of regressions with nonspherical disturbances, and Tran Van Hoa, 1992b, 1992c, and 1992d, in the case of seemingly unrelated regressions).

While all the estimators given above can be applied to the general linear model such as (8) for structural and forecasting analysis, their relative performance in terms of historical, *ex post* or *ex ante* (Pindyck and Rubinfeld, 1991) forecasting MSE can differ. Thus, it is well-known that, in MSE and for $k \geq 3$ and $T \geq k+2$, ßs dominates (that is, it performs better in forecasting MSE) b, and ßs is dominated by ß+s (Baranchik, 1973, Anderson, 1984). However, it has also been demonstrated (Tran Van Hoa, 1985, Tran Van Hoa and Chaturvedi, 1988) that, in MSE, ßh dominates both b and ßs, and more importantly, ß+h dominates ß+s (Tran Van Hoa, 1986a).

Some relevant remarks about estimation of (7) or (8) should be made here. First, an important result of the 2SHI theory has recently been proved (see Tran Van Hoa and Chaturvedi, 1997): *the dominance of the 2SHI over the OLS and Stein exists anywhere in the range* $0 < c < 2(k-1)/(T-k)$. Second, since one of the best known IV estimators, namely the 2SLS, has been demonstrated to be dominated in MSE by the 2SHI in errors-in-variables models and in identified structural equations of simultaneous-equation models (see Tran Van Hoa, 1986b and 1986c) such as Equation (7), the so-called IV (see Frankel and Romer, 1999) impact of the trading partner's trade on ASEAN growth can be directly studied via the application of the 2SHI to (7). Third, while some application of the 2SHI forecasting methods to predictions of economic activities in some developed countries such as Australia (see Tran Van Hoa, 1992d) has been made, these methods have not been investigated explicitly

within an open trade-growth theoretical framework and an empirical context using more recent economic data for the major economies in ASEAN and the East Asia 3. Fourth, the 2SHI estimators are finite-sample estimators (which converge to the OLS or 2SLS when T -> ∞) with optimal MSE properties (see above). Since all data used here are necessarily (due to their limited availability) annual and have, as usual, a small sample size, the study outcomes are therefore finite-sample optimal. Finally, the 2SHI dominates other conventional estimators when measurement errors exist (Tran Van Hoa, 1986b). Since the poor quality of economic data from the Asian countries and other less developed countries economies is well known, one by-product of our study is that the findings are also optimal in errors-in-variables cases.

5. SUBSTANTIVE EVIDENCE ON ASEAN+3 TRADE-GROWTH RELATIONSHIP

Data: Due to the limitation of the required data in our studies, all original data are obtained as annual and then transformed to their ratios (when appropriate). The ratio variables include trade (exports and imports), government budget, and money supply (M2) all divided by GDP, and labour force divided by population. Other non-ratio variables include exchange rates, population and binary variables representing the occurrence of the economic, financial and other major crises over the period 1961 to 2001. All non-binary variables are then converted to their percentages. This percentage measurement is a main feature of our modelling approach and avoids the problem of a priori functional forms (see above) and also of logarithmic transformations for negative data [such as budget (fiscal) or current account deficit].

The data for national (eg, China, Japan and Korea) and regional (eg, ASEAN) trade (exports (X) and imports (IM) respectively), GDP and estimated mean population (named POP) are retrieved from 2001 France's CHELEM international trade databases. Openness between 2 trading countries is defined as T=X+IM although the separate effects of either X or IM have been experimented with (see below). All economic data are at current prices. Fiscal, monetary, trade and industry policy data for ASEAN or each of the Asia 3 are obtained from the 2002 World Bank World Tables and proxied, respectively, by government budget/GDP (BUR), M2/GDP (M2R), exchange rates per US dollar (ER), and employment rate (employment/population or UR). In addition to the usual demographic and economic components in our model, we also identified 4 major world crises that had affected the ASEAN+3 economies (and other economies) during our sampling period and included them as 4 dummy variables with persistent effects after their occurrence (the one-off effects was postulated but discarded as implausible in the study). These are the first oil crisis of 1975 (named C75), the stock market crash of 1987 (C87), the Gulf War of 1991 (C91), and the Asia crisis of 1997 (C97). For China whose data can go back only to 1978, we substitute the country's crisis of 1989 (the Tienanmen Square event) for C75 and call this C89. Various modelling experiments in our study also show that these crises all have a permanent effect on growth in ASEAN.

The Estimated Models: The various bilateral trade-growth models for the ASEAN and each of the East Asia 3 are based on these data. The 2-simultaneous equation trade-growth model for ASEAN and Japan for example in our studies that is based on (7)-(8) for example can be written fully for estimation and analysis as:

$$YA\% = a1 + a2TJP2A\% + a3C75 + a4C87 + a5C91 + a6C97 + v1 \quad \ldots (9)$$

$$TJP2A\% = b1 + b2YJP\% + b3BUR\% + b4M2R\% + b5IPD\% + b6ER\% + b7UR\% + b8POP\% + b9C75 + b10C87 + b11C91 + b12C97 + v2 \quad \ldots (10)$$

where, in percentages, YA=ASEAN's GDP, TJP2A=Japan's total trade (exports+imports or openness) with ASEAN, and YJP=Japan's GDP. The variables BUR, M2R, IPD, ER, UR and POP denote respectively fiscal, monetary, inflation, trade, industry policy and population in Japan. v's are the disturbances representing other unknown factors on YA and TJP2A respectively. The trade-growth models for ASEAN and Korea and China can be similarly constructed.

The Empirical Findings: Three sets of empirical findings for 3 trade-growth models and based on the equations (9)-(10) above for ASEAN and Japan, ASEAN and Korea, and ASEAN and China are given in Table 1. In this table, only the results for the growth structural equation (9) are reported and the modelling performance of the policy/exogenous variables in capturing T for use in (9) is given in Section 6 below. Due to the importance of the estimation methods used that can provide greatly different results even for the same model (see further detail in Frankel and Romer, 1999, Dollar and Kraay, 2004) and also for the purpose of statistical efficiency comparison, three types of estimated structural parameters have been calculated for each model. These are the OLS, the 2SLS and the 2SHI (applied on the 2SLS). For testing hypothesis, the 2SHI has approximately the same asymptotic properties as the OLS and 2SLS. Due to very limited data on government budget for some ASEAN+3 countries, BUR has been omitted from the estimation altogether.

Table 1

ASEAN GROWTH AND TRADE WITH CHINA, JAPAN AND KOREA

EXtended Gravity Theory in Flexible Functional Form – Structural Equations 1968 to 1998

	ASEAN-Japan			*ASEAN-Korea*			*ASEAN-Extended China*		
Variables	*OLS*	*2SLS*	*2SHI*	*OLS*	*2SLS*	*2SHI*	*OLS*	*2SLS*	*2SHI*
Constant	−0.57	−1.31	−1.26	6.70@	−1.63	−1.21	5.37**	3.64	3.12
Openness/GDP	0.56**	0.59**	0.57**	0.28**	0.50**	0.37**	0.45**	0.31@	0.27@
Oil Crisis 75	5.84*	6.42**	6.13**	−2.39	2.16	1.60	—	—	—
Stock Crash 87	−4.87	−5.21*	−4.98*	−0.55	−3.64	−2.70	−4.80	0.47	0.40
China Crisis 89	—	—	—	—	—	—	3.87	3.28	2.81
Gulf War 91	6.19*	6.41**	6.13**	3.80	6.13	4.55	1.22	0.75	0.64
Asia Crisis 97	−9.41**	−15.06**	−14.40**	−13.17**	−8.42**	−6.25**	−12.77**	−26.55**	−22.75**
R^2	0.82	0.87	0.93#	0.55	0.51	0.81#	0.60	0.76	0.85#
F	23.71**	28.06**	69.62**	6.31**	4.49**	20.77**	7.80**	7.46**	16.74**
DW	2.15	1.95	—	1.91	2.43	—	1.77	1.40	—

Sources of data: 2002 World Bank World Tables, 2001 CHELEM International Trade Data.

Notes: ** significant at 5% level, * significant at 10% level @ significant at 15% level. # correlation coefficient between ASEAN's growth and its estimate by the 2SHI. Tests on 2SHI estimates are based on their asymptotic properties as T –> ∞.

From the results given in Table 1, we note 3 important findings. First, while modelling output growth has been difficult to have high success, all 3 estimated models of ASEAN growth vis-à-vis each of its major trading partners in Asia (the East Asia 3) have statistically significant and higher modelling performance (that is, R^2 reaching up to 87 per cent) relative to other trade-growth causality models as reported in previous studies. A graph of the observed and estimated growth fluctuations in the ASEAN for all 3 models for the period under study also indicate that the peaks, troughs and turning points of this growth are fairly accurately predicted. All estimated models also appear free from autocorrelation-induced inefficiency problems. Second, trade, as defined by total trade/GDP between the ASEAN and each of the East Asia 3, has statistically significant and plausibly positive impact (with an elasticity reaching 0.59 for ASEAN+Japan) on ASEAN growth. Third, while the impact of the oil crisis of 1975, the stock market crash of 1987 and the Gulf War in 1991 has a mixed effect on ASEAN growth, the Asia economic and financial crisis starting in 1997 in Thailand has uniformly a significant and deep negative impact on ASEAN growth in all 3 models. More specifically, the impact of this crisis on ASEAN growth, as calculated by the 2SLS, ranges between -8.42 in the ASEAN-Korea model, –15.06 in the ASEAN-Japan model, and –26.55 in the ASEAN-China model.

In other modelling experiments to verify the use of other definitions of trade (see above), we decomposed total trade into ASEAN's imports (i.e., the trading partner's exports) and the trading partner's imports (i.e., ASEAN's exports) separately and included them in the growth-trade equation (15). The empirical findings (not reported here due to space limitation) for the impact of ASEAN's imports and exports on its growth for the 3 models: ASEAN and Japan, ASEAN and Korea, and ASEAN and China, show ASEAN's trade to and from the East Asia 3 is not a significant factor to ASEAN's growth and the Asia crisis the only significant factor.

6. ASEAN+3 TRADE-GROWTH CAUSALITY AND IMPLICATIONS FOR ITS FREE TRADE AGREEMENT

Does ASEAN's trade cause its growth? This is an important topic in economics that has attracted some of the best minds in the field over the last 10 years or so (see for example Frankel and Romer, 1999, for some survey, or Dollar and Kraay, 2004)), and the conclusions have not been finalised for all cases. Our results above show that in the specific case of ASEAN+3, ASEAN's trade, when defined as its relative size of openness, has ample empirical support as a significant and positive determinant of the region's growth. Importantly, for the East Asia 3 in focus and for the available data at our disposal (1968-1998), a strong trade-growth causation is found especially for developed OECD-level countries with high trade activities such as Japan and Korea. For developing China, the impact is, even though less significant, still positive. This less successful finding for China is perhaps due to more limited sampling size and thus less available information for the country's study.

When trade is decomposed into its 2 components, exports and imports, the findings of trade-growth causation are not so clear-cut for the ASEAN and the East Asia 3. This result is not a case of multicollinearity as ASEAN's exports and imports cannot be assumed to be collinear even for time-series data and the East Asia 3. The East Asia 3's exports to ASEAN seemed the main contribution to ASEAN's growth.

Do Crises Affect ASEAN's Growth? When openness is used as a proxy for trade between ASEAN and the East Asia 3, crises and trade do appear to affect ASEAN's growth. It is interesting to note that high-trade countries such as Japan seem to be affected by more crises than less high-trade countries like Korea and especially China. When decomposed trade is used however, the Asia crisis of 1997 is found to be the only factor that has exerted a strong and uniform impact on ASEAN's growth in all 3 ASEAN+3 models. A natural conclusion is that a contemporary trade-growth model for ASEAN+3 (or even for other regions or countries) studies without the inclusion of these recent shock factors (as implied by Frankel and Romer, 1999, or stipulated by Johansen for policy analysis, 1982) may have serious and biased results on the causation being explored (for further detail on the Asia crisis, see Tran Van Hoa, 2002b).

Are Trade-Growth Causation Results Affected by Estimation Methods? In previous studies of trade-growth, OLS results of trade-growth models based on the gravity or similar theory seem to indicate an underestimation of the trade effect. 2SLS or generally IV estimates of the trade effect are usually found to be larger with these IV estimates. Four reasons have been put forward to support the underestimation of the OLS and two explanations for the overestimation of the 2SLS (see Frankel and Romer, 1999, for a brief survey). In our studies using openness, the overestimation of the 2SLS is found for the trade effect in the ASEAN-Japan and ASEAN-Korea models, but the reverse is found for the ASEAN-China case. In studies with decomposed trade however, the 2SLS estimated impact is lower than that of the OLS for all 3 models and only in terms of ASEAN's imports from the East Asia 3. For ASEAN's exports, the OLS-based trade elasticities are uniformly larger than their 2SLS counterpart.

It is well known from the bias $-b\mathrm{Cov}(Vu)$ of the OLS in errors-in-variables models (that is, $y = \beta X^* + u$, but X^* is unobserved and proxied by observed X with $X = X^* + V$, where V is measurement errors) or equivalently simultaneous-equation models that the specification of the model or the instruments [as captured through Cov(Xu)] solely determines a downward or upward bias of the OLS. In our view it is the nature of the model and the characteristics of the instruments that determine the estimation bias. A general conclusion may not be made in this case.

When we are focused on higher efficiency for the estimates of the models that are subject to misspecification (e.g., omitted relevant variables) or measurement errors or simultaneity, then the 2SHI estimates should be used. In this case, the impact based on the OLS and 2SLS are both overestimated. The smaller MSE estimates of the trade impact as obtained by the 2SHI and compared to the 2SLS are given for all models in Table 1.

Are Reduced-form Estimates of Trade Good Proxy for ASEAN+3 Trade and Its Shifts? This is a question on the accuracy and reliability of the trade-growth model and the instruments used (a point often raised in the literature, see Frankel and Romer, 1999). The answer in this case has to be relative as different models will have different instruments and therefore different accuracy or reliability outcomes. To answer this question on our models, we have calculated the proxy for T, say >, from its reduced form for each of the estimation requiring a knowledge of >. Standard evaluation criteria such as the correlation coefficient and the Theil-MSE-decomposition Um (bias), Us (variation) and Uc (covariance) are then used to evaluate the proxy performance of > as compared to its actual

T in each model reported in Table 1. The results of this evaluation are given in Table 2 and the modelling performance of ASEAN+3 trade proxies (TJP2ACF, TKR2ACF, TCN2ACF) as compared to their actual trade (TJP2AC, TKR2AC, TCN2AC) over the estimation sample periods is given in Charts 1-3.

We first note from Table 2 that, as in the cases earlier with GDP, the > can fairly accurately emulates all troughs, peaks and turning points of the actual T in all 3 models ASEAN-Japan, ASEAN-Korea and ASEAN-China. In addition, the results indicate that, according to the evaluation criteria used in Table 3, the > seems to be a good estimated proxy to T in all models. This finding would enhance the robustness of our 2SLS estimation of the impact of trade on ASEAN growth. From the charts, the trade proxies also appear to have modelled generally well the peaks, troughs and turning points of ASEAN trade with Japan, Korea and China.

Table 2

RELIABILITY OF TRADE PROXY USED IN ASEAN+3 TRADE-GROWTH STRUCTURAL MODELS OPENNESS (EXPORTS+IMPORTS)/GDP 1968 TO 1998

Model	*ASEAN-Japan*	*ASEAN-Korea*	*ASEAN-China*
Correlation Coefficient	0.85	0.68	0.75
RMSE	10.37	18.78	8.35
Mean Error	0.00	0.00	0.00
Um	0.00	0.00	0.00
Us	0.08	0.19	0.14
Uc	0.92	0.81	0.86

Notes: Ub+Us+Uc = 1. See Pindyck and Rubinfeld (1991) for further detail on these evaluation criteria. The estimates are based on TSP.

CHART 1: MODELLING ASEAN-JAPAN GROWTH OF TRADE (1968-1998)

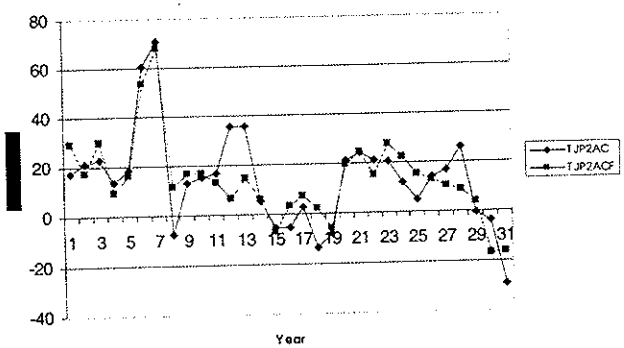


CHART 2: MODELLING ASEAN-KOREA GROWTH OF TRADE (1968-1998)

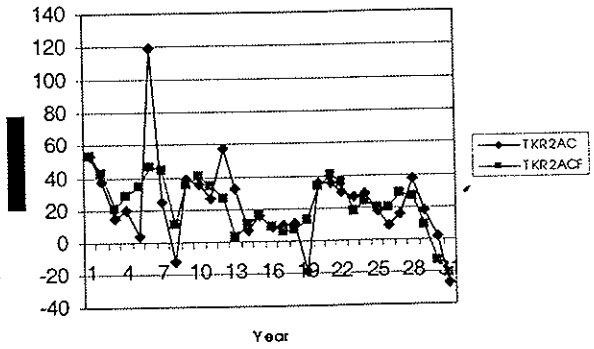
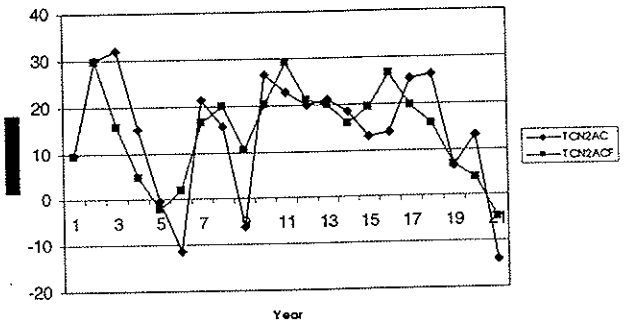


CHART 3: MODELLING ASEAN-CHINA'S GROWTH OF TRADE (1968-1998)



Do We Have Empirical Support for ASEAN+3 Trade and Growth Improvement? As we have mentioned earlier, the objectives of setting up an ASEAN+3 TFA are, in addition to better regional cooperation and stability, to enhance trade between its 13 members and to improve their welfare. These objectives necessarily require that trade does in fact directly and positively affect growth. What are the determinants of trade and how they affect growth provide only auxiliary information on the interaction of the various activities in the trading country partners, and to provide a more accurate measurement of the trade impact. Our findings reported above lend ample support to the hypothesis that trade between ASEAN and Japan, Korea and China does affect ASEAN's growth, and this is sufficient to provide an empirical basis to Asian policy-makers to push for bilateral regional FTAs such as ASEAN+Japan, ASEAN+Korea and ASEAN+China.

The findings also indicate that, while trade of the East Asia 3 plays an important part in improving ASEAN's growth, major external shock factors and especially the Asia crisis of 1997 have been found to be influential in causing a decline in ASEAN's growth. A pure gravity theory may, in this case, not be able to integrate these factors in its successful explanation of trade-growth causality. In addition, better economic crisis management to minimise or even prevent similar future crises is seen to be a main ingredient to promote ASEAN+3 growth (Tran Van Hoa, 2002a).

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